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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/814,094	03/30/2004	Frederick A. Perner	200402658-1	7294

7590

09/07/2005

HEWLETT-PACKARD COMPANY  
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EXAMINER

NGUYEN, THINH T

ART UNIT PAPER NUMBER

2818

DATE MAILED: 09/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/814,094

Applicant(s)

PERNER ET AL.

Examiner

Thinh T. Nguyen

Art Unit

2818

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 04 August 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-9 and 21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7, 9 and 21 is/are rejected.
- 7) ☒ Claim(s) 8 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED OFFICE ACTION

### *Specification*

1. Applicant election of claims 1-9,21 for prosecution without traverse in the communication with the Office on 8/4/2005 is acknowledged.
2. The specification has been checked to the extent necessary to determine the presence of all possible minor errors. However, the applicant cooperation is requested in correcting any errors of which the applicant may become aware in the specification.

### *Claim Rejections - 35 USC § 103*

3. The following is a quotation of U.S.C. 103(a) which form the basis for all obviousness rejections set forth in this office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.
4. Claims 1-4 ,9, 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over-Durlam et al. ( U.S. patent 5,940,319) in view of Perner( U.S. patent 6,462,388).

### REGARDING CLAIM 1

Durlam ( the abstract, fig 14-17,claim 1) discloses all the invention including

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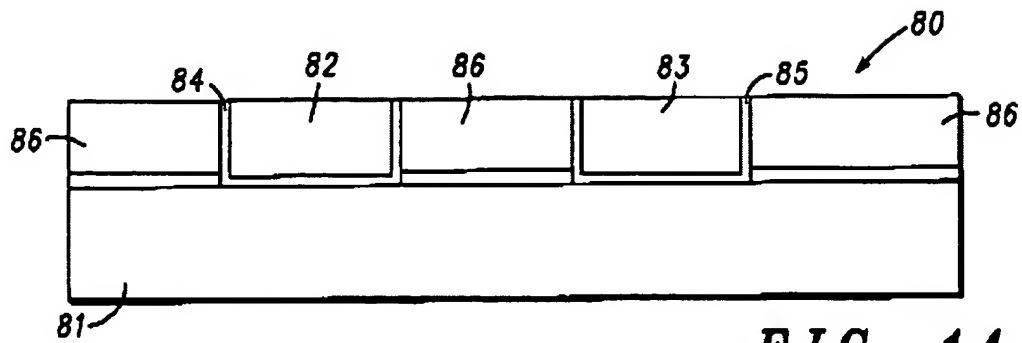
a magnetic memory cell comprising: a magnetic storage element, the magnetic storage element having a plurality of layers ( fig 17 magnetic storage element 92 and 94) including a first magnetoresistive layer and a second magnetoresistive layer and a non-magnetic material layer therebetween and a diode ( fig 17 diodes 93,95, column 6 line 29-30, lines 42-46) ) using as current control element coupled to the magnetic storage element to control current flow therethrough, the current control element including a first region of material of a first conductive type and a second region of material of a second conductive type and defining a junction therebetween, missing in the Durlam reference a diode structure wherein the junction extends transversely to each of the layers in the magnetic storage element.

Perner, however, in fig 1-2 , in the abstract, in column 3 lines 60-64 discloses a diode structure wherein the junction extends transversely to each of the layers in the storage element.

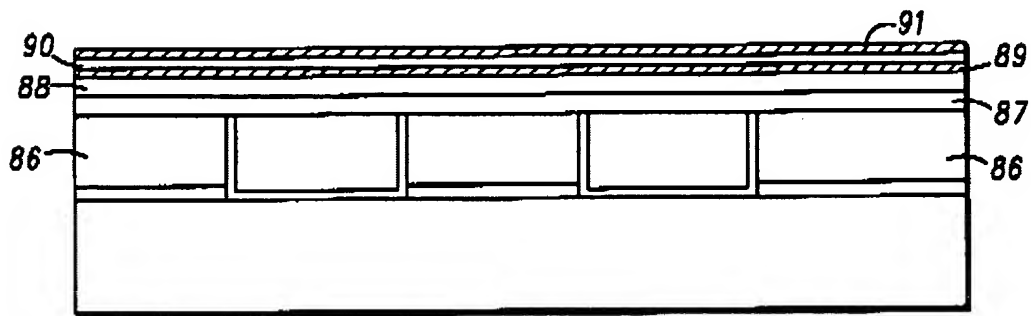
It would have been obvious to one of ordinary skill in the art the time the invention was made to combine the teachings by Durlam and the teachings by Perner and come up with the invention of claim 1.

The rationale is as the following;

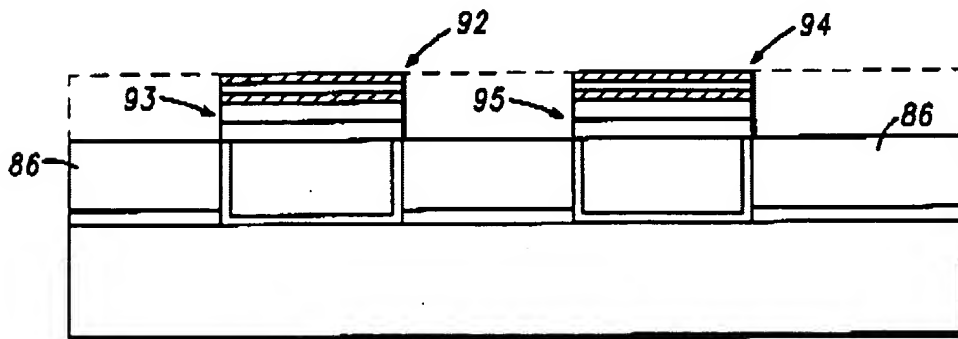
A person skilled in the art at the time the invention was made would have been motivated to improve the isolation feature of the device invented by Durlam using the disclosure of Perner as suggested by Perner 388 reference in column 1 lines 57-60.



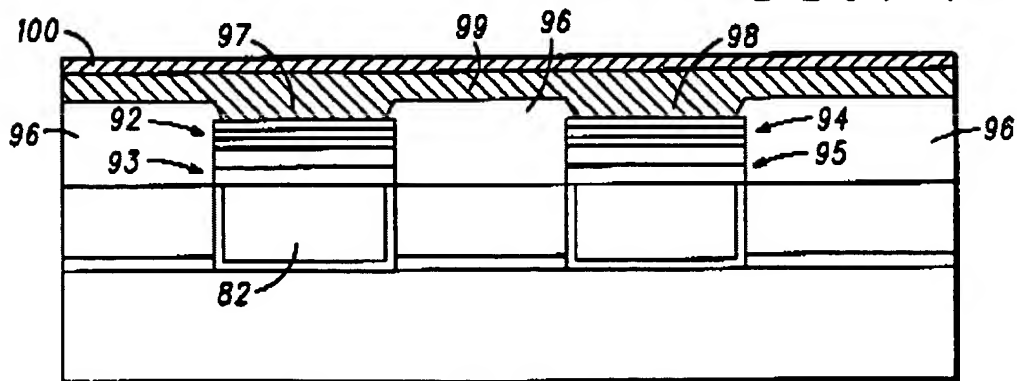
**FIG. 14**



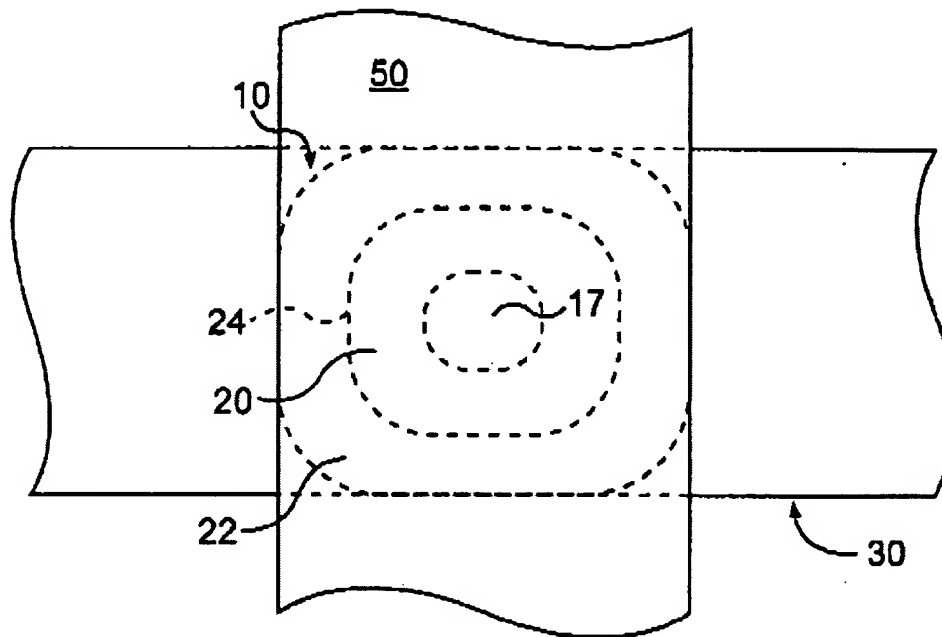
**FIG. 15**



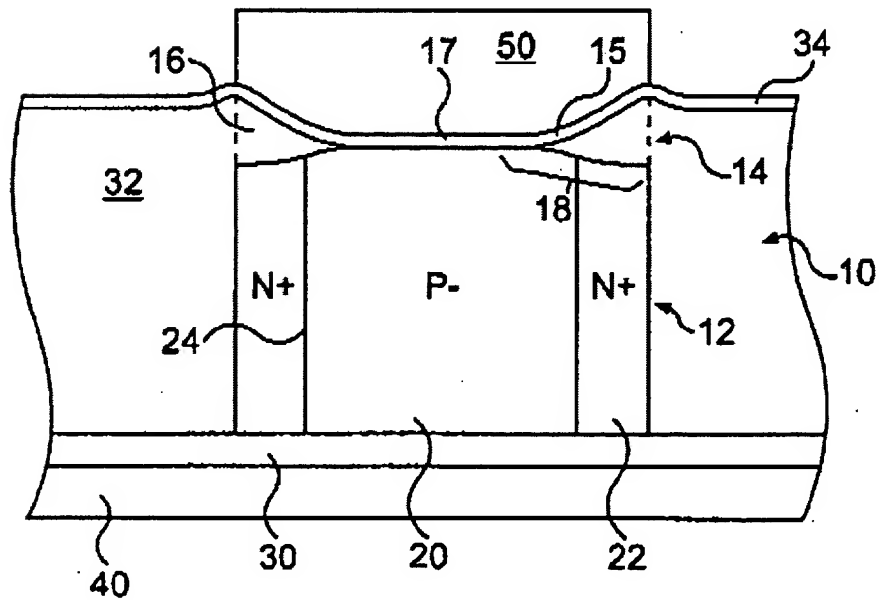
**FIG. 16**



**FIG. 17**



**FIG. 1**



**FIG. 2**

#### REGARDING CLAIM 2

Durlam discloses the structure of a magnetic memory cell while Perner 388 ( fig 1, fig 2, the abstract ) discloses a memory cell wherein the first region of the current control element is in the form of a core and the second region is in the form of a circumferential layer formed on the core, wherein the first and second regions form a pillar structure.

The rationale as why claim 2 is obvious over Durlam in view of Perner has been discussed in the rejection of claim 1.

#### REGARDING CLAIM 3

Durlam discloses the structure of a magnetic memory cell while Perner 388 ( fig 1, fig 2, the abstract ) discloses a memory cell wherein storage element is connected to the core at one end of the pillar structure.

The rationale as why claim 3 is obvious over Durlam in view of Perner has been discussed in the rejection of claim 1.

#### REGARDING CLAIM 4.

Durlam discloses a magnetic memory cell wherein the current control comprises a diodes ( fig 17 diodes 93,95,column 6 line 29-30, lines 42-46)

The rationale as why claim 4 is obvious over Durlam in view of Perner has been discussed in the rejection of claim 1.

#### REGARDING CLAIM 9

Durlam discloses a magnetic memory cell ( fig 17) wherein the magnetic storage element and the current control element are integrated.

The rationale as why claim 9 is obvious over Durlam in view of Perner has been discussed in the rejection of claim 1.

#### REGARDING CLAIM 21

Durlam discloses a magnetic memory cell ( fig 17) wherein the memory cells are magnetoresistive random access memory cells (see Durlam title).

5. Claims 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over- Durlam et al. ( U.S. patent 5,940,319) in view of Perner( U.S. patent 6,462,388) and in further view remark.

#### REGARDING CLAIM 5-7

As discussed in the rejection of claim 1; the combined teachings by Durlam and Perner discloses all the invention including a schottky diodes ( see Durlam reference column 6 line 46) except for the use of metal silicide such as platinum silicide as schottky barrier.

This feature, however, is considered obvious since the use of metal silicide such as platinum silicide as schottky barrier is old and well known in the art as evidenced by the disclosure by Chiang (US patent 3,841,904, the abstract).

It would have been obvious to one of ordinary skill in the art the time the invention was made to combine the teachings by Durlam and the teachings by Perner and his own routine design skill come up with the invention of claim 5-7 as it is well known in the art that metal silicide improve the Schottky barrier as disclosed in Chiang abstract.



### **ALLOWABLE SUBJECT MATTER**

6. Claims 8 is objected as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all the limitations of the base claim and any intervening claim.

Claim 8 is considered allowable since the prior fails to teach a structure that has the additional technical features as recited in claim 8.

7. When responding to the office action, Applicants are advised to provide the examiner with the line numbers and the page numbers in the application and/or references cited to assist the examiner to locate the appropriate paragraphs.

9. A shortened statutory period for response to this action is set to expire 3 (three) months and 0 (zero) day from the day of this letter. Failure to respond within the period for response will cause the application to be abandoned (see M.P.E.P. 710.02(b)).

### **CONCLUSION**

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thinh T Nguyen whose telephone

number is 571-272-1790. The examiner can normally be reached on Monday-Friday 9:00am-6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms can be reached at 571-272-1787.

The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval [ PAIR ] system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in dark ink, appearing to read 'Thinh T. Nguyen', is written over a horizontal line.

**Thinh T. Nguyen**

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